form), both of which grow in the vicinity but do not hybridize commonly. Stout, firm-textured pitchers about 6-9" high are produced throughout the growing season. They taper gradually from bottom to top to produce a broad cone with very wide slightly wavy-margined erect hoods. As the pitchers grow and mature they show various colors. The colors are intricate and subtle, yet rich and interesting with predominately maroons and oranges as a background for dark red veins. There are no aereolae (or light windows) evident as there would be if *S. leucophylla* were involved in the hybrid. The flower is also very large and attractive, somewhat orange-pink in color. We have already used this cultivar in cross-pollination with other attractive specimens.

The most important feature of this hybrid is the fact that the pitchers remain fully intact and colorful throughout the winter in an unheated greenhouse where temperatures occasionally go just below freezing. Since most Sarracenias die down in winter, we believe this is an exciting characteristic to use in breeding plants that look good year around. So far the plant appears vigorous, and it looks like it is going to become even larger.

References cited:

Bell, C.R. 1952. Natural Hybrids of the genus *Sarracenia*. Journal of the Mitchell Society 68:55-80. [A classic]

Pietropaolo, James and Patricia. 1986. Carnivorous Plants of the World. Timber Press, Portland, Oregon. 206 pages. [brand new attractive book]

Schnell, D.E. 1976. Carnivorous Plants of the United States and Canada. Blair, Winston-Salem, N.C. 125 pages. [best manual on native CP]

Note: The US Fish and Wildlife (USFW) -Office of Scientific Authority is *considering* listing all *Sarracenia* species on Appendix II of CITES.

SARRACENIA UNDER ARC LAMPS

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Living in Wisconsin, where outdoor culture of most CP is impossible, I've encountered difficulties growing the taller species of *Sarracenia* indoors under artificial light. However, it is possible to achieve excellent results when adequate light and humidity are confined to a properly sized growing area.

I felt confident when I received one *S. leucophylla,* one *S. leucophylla x S. oreophila,* two *S. flavas,* one *S. purpurea x S. minor,* and one *S. alata.* Knowing they required plenty of humidity, I purchased three, twenty-gallon, long aquariums (12"x12"x30"). One of the tanks I used in the traditional manor (lying flat with a glass cover). The other two I modified by standing them on end and hinging the glass to make a door. On the bottom from the inside, I siliconed in a twelve by eight inch piece of plexiglass to form a waterproof box at the base of the tanks for the growing medium. These tanks proved vital to me in providing the proper humidity levels so necessary for the plants we enjoy.

To provide light, I constructed three somewhat pyramid-shaped hoods to house the fixtures. For the conventional tank I installed three, two-foot, twenty-watt fluorescent bulbs. The modified tanks were supplied with three, eight-inch, twenty-two watt circular fluorescent bulbs. On all the hoods small electric fans were installed to dissipate heat produced by the lights and ballasts.

As would be expected, the conventional tank containing some decumbent sarracenias, pinguiculas and droseras not mentioned previously, did quite well; however, not so with the modified tanks. The *S. leucophylla* produced distorted pitchers with over-sized wings, under-developed lids and no venation. While one *S. flava* died, the *S. leucophylla x S. oreophila* produced nothing but phyllodia. The *S. purpurea x S. rubra* did nothing for six months. The *S. minor* and *S. alata* grew tiny spikes from the rhizome. Where nice healthy growing plants were once, now was a disaster.

Not wishing to see my favorite type of CP meet a slow and agonizing demise, I sought other alteratives in artificial light sources. Because of the problems that exist with incandescent sources such as heat, low efficiency and spectrum problems, I sought information on arc lamps. There are a variety of arc type lamps and ballasts using different substances as their source of emission, each one having its own spectral peaks. Since mercury emits a stronger range of bluer light, I felt it would be best suited for supplying the proper bands required for plant growth.

I replaced the fluorescent bulbs with a one hundred seventy-five watt deluxe, white, mercury arc lamp. By remoting the ballasts, the heat was easily dissipated with the electric fan. This lamp produces about seven times the luminary output of a two-foot, twenty-watt fluorescent bulb. Because the light is emitted from a peanut-size envelope located within the protective bulb, rather than spread out over fourteen feet of bulb, it is easier to confine with a reflector constricting it to the growing area.

The plants responded immediately. I won't expound on the joys of seeing a very mature rhizome produce textbook pitchers, however, a noteworthy remark should be made about the coloration. All the plants, regardless of species, seemed to take on the same hue, a very maroonish color. I later grew a cobra lily under a mercury arc lamp and it took on the same color as the *S. purpurea x S. rubra* and *S. leucophylla.* This was also apparent in the conventional tank being supplied with fluorescent light.

As the *S. leucophylla* and *S. flava* grew, it became evident they weren't going to fit in the twenty-gallon long tank, the height being only about two feet. I found that a fifty-gallon aquarium could accommodate a growing height of about three feet. Instead of a glass door, I used one quarter inch mar-resistant lexan for safety reasons. A simple wood strip with a short piece of surgical tubing looped on either end acted like a big rubber band and replaced the hinge.

Because of the additional height (and the suffering I put my plants through), I felt I would need more light, despite the greater output of the mercury lamp. I chose the one hundred seventy-five watt metal halide arc lamp for two reasons. While the mercury arc lamp stands alone in its nice peak in the bluer bands, the metal halide has a spectral distribution confined mainly in the redder bands. Also the metal halide arc lamp is 60% more efficient than the mercury lamp, making it slightly more efficient than fluorescent sources. A special hood was designed to accommodate the lamp in a vertical position since metal halide lamps cannot operate efficiently in a horizontal position. The ballasts were remoted with good heavy-gauge wire. A fan was installed at the top and the lamp fitted with a reflector.

This unit provided more than adequate lighting. Not only were the plants more stout, with wide flaring pitchers, but all the secondary tones began to emerge. Where only maroon was, now were yellows, coppers and bright reds. I later planted a variety of decumbent species including *S. purpurea,* venus fly traps, and some droseras and pinguiculas. Providing there was room above to allow the light to pass through, even the venus fly traps produced deep red traps at over three feet from the light source. I later acquired a variety of almost all the genuses of CP and have found little difficulty in maintaining them in a healthy state, providing dormancy and proper photoperiod requirements are met.

By using these methods of maintaining proper humidity and adequate light in a sufficiently sized container, it is possible to bring your favorite sarracenias indoors. Even the tallest of sarracenias can be expected to grow, multiply and flower in these self-contained growth chambers in an area where they can be constantly viewed and admired. (Photos on next page.)

S. *oreophila* under metal halide at thirty inches from light source.

Fifty-gallon aquarium with one hundred seventy-five watt metal halide lamp.

Photos by J. De Franco

S. *purpurea purpurea* under mercury arc at twenty inches from light source.

S. "Okefenokee" *minor x psittacina* under mercury arc at eight inches from light source.